IN THE FIELD

Field Museum
Member Magazine

Vol. 95, No. 3
Fall 2024

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PUBLISHER
Charles L. Katzenmeyer, Vice President, Institutional Advancement

EDITOR
Chandler Cohron, Development Communications Manager, Institutional Advancement

EDITORIAL TEAM
Mary Askelson, Senior Director of Membership; Vicky Sanchez, Annual Fund and Membership Director; Jenna Lieblich, Membership Manager; Rachel Wegner, Development Communications Intern; Mark Alvey, Academic Communications Manager; Kate Golembiewski, PR and Science Communications Manager

DESIGNER
Bark Design, barkdesignchicago.com

PHOTO SPECIALIST
Nina Cummings, Library Photo Archivist.

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ON THE COVER
Caracal pursuing guinea fowls.
MNHN F.-G. GRANDIN

Let us know your thoughts about *In The Field* magazine. Email your comments to ITF@fieldmuseum.org

IN THE FIELD (ISSN #1051-4546) is published three times a year by the Field Museum. Opinions expressed by authors are their own and do not necessarily reflect the policy of the Field Museum. Notification of address change should include an address label and should be sent to Membership.

1400 S. DUSABLE LAKE SHORE DR.
CHICAGO, IL 60605-2496
312.922.9410
FIELDMUSEUM.ORG

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Advisory Notice: Human remains are presented on page 5 of this issue.

Dear Friends,

FIELD MUSEUM 2021 (KYLE FLUBACKER PHOTOGRAPHY)

Field Museum members are vital partners in the Museum's mission: connecting all of us to nature and the human story. I am grateful for your investment, which has been—and continues to be—critical to the work of our scientists and educators.

Your dedication keeps the Field at the forefront of scientific excellence. You support our scholars' work across the world on research and conservation sites. You provide opportunities for more than 150,000 school visitors annually to bring learning to life. And you sustain an irreplaceable natural history collection for generations of scientists and visitors to come.

This holiday season, I invite you to consider expanding your Museum community. Gift memberships create priceless memories at the Field. From our famous Members' Nights to the festive Member Holiday Lounge, and even this very magazine, there is so much to enjoy as a member. Please see the back of this issue to learn how to invite family and friends to join us in a new year of discovery.

With gratitude, and with warm wishes for the holiday season,

Julian Siggers

Julian Siggers, PhD
President and CEO

MEMBERS SEE IT FIRST. MEMBERS SEE IT FREE.

FIELD MUSEUM

Explore the world in our galleries, right here in Chicago—all year long. Members enjoy the following benefits:

- Free all-access admission
- Annual Members' Nights
- Spooktacular Science family day in October
- Members-only Holiday Lounge in December
- After-hours exhibition openings and lectures
- Discounts on 3D movie tickets—up to 50% off
- Discounts on birthday party packages
- 10% off Museum store and restaurant purchases
- Family nights and programs
- Discounts and early registration for Summer Camps, Dozin' with the Dinos, and other educational programs
- Double discount days in October and December (20% off in the restaurants and Museum store)
- Free subscription for *In The Field*, including a family friendly pull-out section and the annual photography competition.
- Member e-newsletter with updates for the whole family
- Free reciprocal admission to participating science and technology museums all over the world (ASTC)
- Free admission to annual heritage month programs
- Discounts on evening cultural programs

FIELD MUSEUM, JOHN YOUNG 2022

Celebrate

NATIVE AMERICAN HERITAGE MONTH AT THE FIELD!

BY JADA WHITEROCK, EARLY CAREERS MELLON FELLOW IN NORTH AMERICAN ANTHROPOLOGY, GANTZ FAMILY COLLECTIONS CENTER

Native American Heritage Month takes place at the Field Museum and nationally in November. This month we honor and celebrate the rich cultural heritage, traditions, and significant contributions of Native American communities.

This year Dave Spencer at the American Indian Center of Chicago hosted the opening ceremony on November 8th followed by traditional song and dance performances. The Field Museum resides on the ancestral homelands of the Three Fires Confederacy: Ojibwe, Odawa, and Potawatomi. Chicago also includes the homelands of the Miami, Ho-Chunk, Menominee, Sac, Fox, Kickapoo, and Illinois Nations. The Museum area was a site of trade, gathering and healing for more than a dozen other Native tribes.

Celebrate the resilience and community of Native American cultures at the Field in *Native Truths: Our Voices, Our Stories* and then follow our scavenger hunt to discover more!

Check out the other side for a museum scavenger hunt!

Cut me out and explore!

NATIVE AMERICAN HERITAGE MONTH

Scavenger Hunt

See if you can find each item and answer the questions on your next visit!

MAIN LEVEL

Bison is a significant animal in Lakota culture. Before Euro-Americans settled in the western United States, the Lakota would follow bison while traveling. Bison were also used for food, clothing, shelter, jewelry, and tools.

What is the word for bison in Lakota?

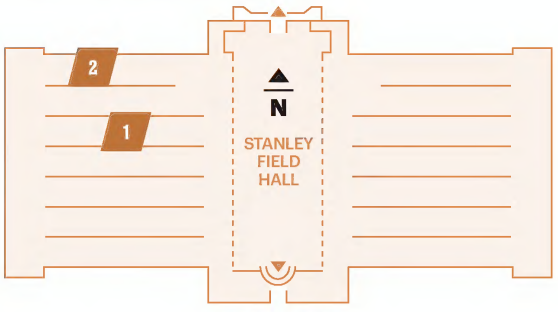
ANSWER HERE

The eagle is a meaningful animal and symbol in Lakota Culture. It represents bravery, strength, and connection to spirituality. Wearing and using eagle feathers also holds cultural significance and symbolism.

What is the word for eagle in Lakota?

ANSWER HERE

LOCATION CLUES:



MAIN LEVEL

UPPER LEVEL

The Cherokee writing system, called a syllabary, was created by Cherokee artist and scholar Sequoyah in 1821. Each of the 85 characters represents a different syllable. The Cherokee word for 'tobacco' is made up of two characters, pronounced 'tsola'.

How do you write the Cherokee word for "tobacco" in the Cherokee syllabary?

ANSWER HERE

The turquoise stone is associated with Mount Taylor in New Mexico. Both the stone and the mountain are considered sacred to the Diné (Navajo). Turquoise is worn for protection and as a way to identify oneself to Diné deities.

What is turquoise called in Navajo?

ANSWER HERE

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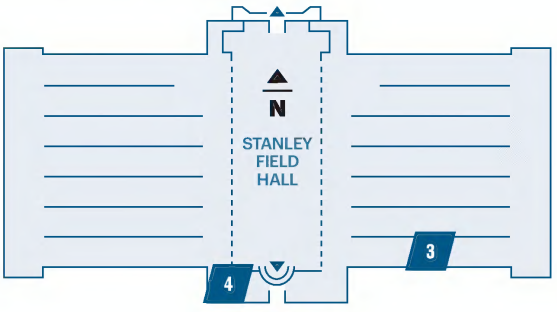


UPPER LEVEL

ANCIENT TEMPLE DISCOVERED IN PERU

BY LUIS MURO YNOÑÁN, PHD, RESEARCH SCIENTIST, NEGAUNEE INTEGRATIVE RESEARCH CENTER

This summer, my team and I conducted archaeological explorations in the Zaña Valley, a small area located in northwestern Peru. Our work has specifically focused on the unknown archaeological site of Cerro Las Ánimas-La Otra Banda, located a few kilometers away from the old colonial town of Zaña, Lambayeque Region. The site extends over an area of 20 hectares surrounded by desert dunes and an extensive dry forest of *algarrobos* (a local tree species). We conducted excavations at the western and northern sectors of the site, revealing that is was occupied for a long period of time during Andean prehistory.

In the western sector, we found what seems to be a small ancient theatre structure composed of a stage-like platform, a kind of backstage, and a frontal patio—accessed through a staircase, badly damaged by looters, unfortunately. Descending from the staircase, we found two clay slabs decorated with high-relief designs. One of them depicts a mythological creature whose body is made up of human, bird, and reptile attributes. We also found a mural decorated with geometric designs in red, yellow, black, and blue colors. Probably representing the head of a bird (upside-down), the design seems to be part of a greater fresco still unexcavated. Pending confirmation by Carbon 14 dating, this structure might be part of a 4,000-year-old religious complex, contemporary to some of the oldest religious constructions from the Andean Initial Period (2,500–1,500 BCE).

In the northern sector, we uncovered a Late Moche (650–850 CE) religious monumental construction, which was fully obscured by an extensive dune. We exposed part of the structure's eastern façade, showing a stair-like decorative pattern. Part of the structure (of roughly 25 meters high) was covered by a fine, although badly damaged, clay plaster. We found human remains in the construction fills of both religious structures; these bodies were probably placed there as human offerings.

These excavations were conducted as part of the Úcupe Cultural Landscape Archaeological Project, which I have lead since 2022 with the support of various institutions from the US and Peru, including Dumbarton Oaks, Archaeology in Action, the Pontifical Catholic University of Peru and the Field Museum.

(Below) Human offerings found in the construction fills of the earlier religious construction at the site.

(Bottom) Theater-like structure found on the western sector of Cerro Las Ánimas—La Otra Banda. The original floor, platform, and decorative panels were badly damaged by looters.

ÚCUPE CULTURAL LANDSCAPE ARCHAEOLOGICAL PROJECT

MNHN F.-G. GRANDJEAN

FIELD MUSEUM SCIENTISTS PLAY A CRITICAL ROLE IN THE PROTECTION AND PRESERVATION OF CATS IN THE WILD, MORE THAN HALF OF WHICH ARE ENDANGERED OR THREATENED.

(Opposite) A jaguar lurks in the remote forests of the Amazon Basin.

(Above, right) Field Museum conservator Dan Kaping works on a Field Museum lion (FMNH 301) for the exhibition.

(Below) The maneki-neko is a popular Japanese figurine that is believed to bring good luck. They depict a Japanese Bobtail cat with its paw raised in a beckoning gesture. In some version of the figurine the paw moves back and forth in a swinging motion.

ISTOCKPHOTO.COM

CATS
PREDATORS TO PETS

By Lauren Boegen
Exhibitions Project Manager

For thousands of years, cats large and small have been a part of our lives. They are everywhere—in homes, on computers, in the wilderness, and as part of our language. Originating at the Muséum national d'Histoire naturelle in Paris, France, *Cats: Predators to Pets* introduces visitors to feline evolution, anatomy, and behaviors through interactives, media, and more than 40 specimens of cats on display. The exhibition immerses us in the shared characteristics of both wild and domestic cats and celebrates their global impact.

Field Museum scientists play a critical role in the protection and preservation of cats in the wild, more than half of which are endangered or threatened. The Keller Science Action Center is involved in the Americas conducting on-the-ground inventories that result in governmental protection of ecosystems. This includes work in the Guiana Shield in South America—an area many endangered cats call home including ocelots, jaguars, margays, and oncillas—and in Chicagoland protecting local wild cat habitats. Museum researchers also study how to care for feline populations. Studying pampas cat specimens from museums around the world, Field Museum Assistant Curator of Mammals Anderson Feijó, PhD, and colleagues discovered what was originally believed to be one species of Pampas cat is actually five separate species, each evolving in distinct climates in South America.

The exhibition will also explore our personal connection to cats. People originally developed this relationship because cats hunted the rodents that destroyed harvested and stored grain. Eventually, cats became not only pets, but also symbols of the divine. Today, from maneki-nekos on restaurant counters to viral internet sensations like Grumpy Cat (who once visited the Museum!) to Saturday morning cartoons to the ubiquitous Hello Kitty, cats are everywhere.

Despite intense regulation, however, big cats are still severely trafficked. Also, domestic cats pose a great threat to wildlife populations. There are roughly 150 million outdoor cats in the United States, and responsible cat ownership and care is critical to protecting birds and small mammals. If there is not more action taken on domestic and international habitat destruction, poaching, and trafficking, many species of cats could be extinct by 2050. To protect cats, we must first seek to understand them.

Cats: Predators to Pets is open Friday, November 29, 2024 to April 27, 2025.

Cats: Predators to Pets
Field Museum Major Sponsor:

DISCOVER

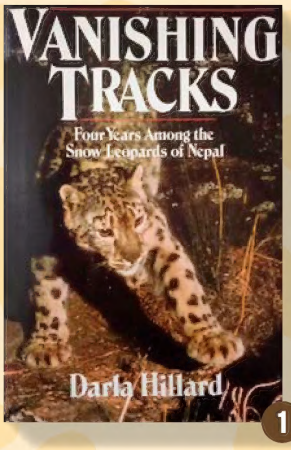
Exhibition Sponsor: WORLD'S BEST CAT LITTER

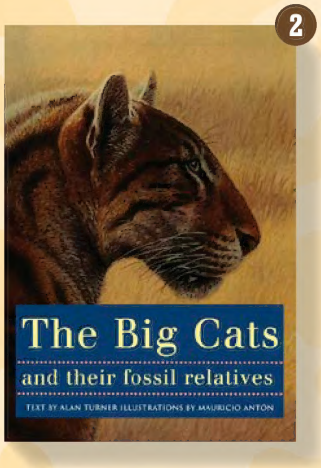
This exhibition was created by the Muséum national d'Histoire naturelle, France.

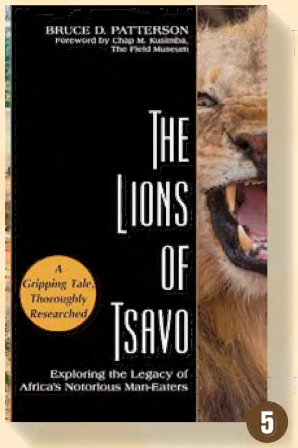
THE SCIENTIST'S BOOKSHELF

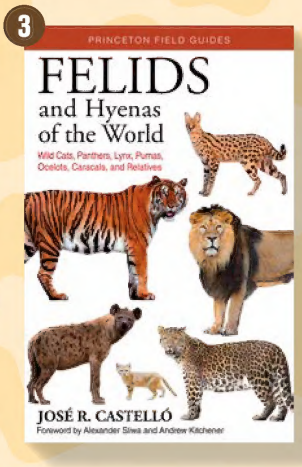
Science is for everyone! Whether you're out in the field or cuddling up with a great book, science learning can be done anywhere. We asked Assistant Curator of Mammals, Anderson Feijó, PhD, and Collections Manger of Mammals, Adam Ferguson, PhD, what they're reading to get ready for *Cats: Predators to Pets*. Head to your favorite local bookstore or stop by the Field Museum store to explore these titles.

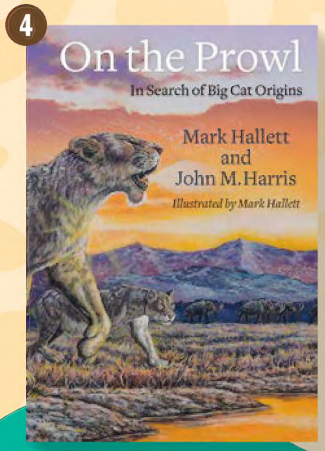
Visit our website at **store.fieldmuseum.org** or scan the QR code to explore.






BRUCE D. PATTERSON
Foreword by Chip M. Kusenda, The Field Museum
THE LIONS OF TSAVO
A Gripping Tale Thoroughly Researched
Exploring the Legacy of Africa's Notorious Man-Eaters
5


3
PRINCETON FIELD GUIDES
FELIDS
and Hyenas of the World
Wild Cats, Panthers, Lynx, Pumas, Ocelots, Caracals, and Relatives
JOSÉ R. CASTELLÓ
Foreword by Alexander Sliwa and Andrew Kitchener



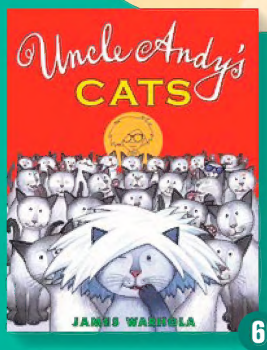
1 ***Vanishing Tracks: Four Years Among the Snow Leopards of Nepal***
Darla Hillard

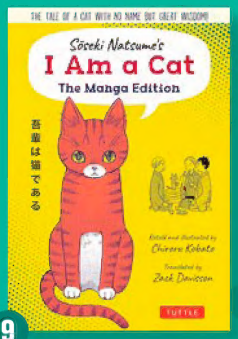
2 ***The Big Cats and Their Fossil Relatives***
Mauricio Antón and Alan Turner

3 ***Felids and Hyenas of the World: Wildcats, Panthers, Lynx, Pumas, Ocelots, Caracals, and Relatives***
Dr. José R. Castelló

4 ***On the Prowl: In Search of Big Cat Origins***
Mark Hallett and John Harris

5 ***The Lions of Tsavo: Exploring the Legacy of Africa's Notorious Man-Eaters***
Bruce D. Patterson, PhD, Field Museum Emeritus Curator





FOR THE KIDS:

6 ***Uncle Andy's Cats***
James Warhola

7 ***No Cats in the Library***
Lauren Emmons

8 ***Pusheen the Cat Collection***
Claire Belton

9 ***Soseki Natsume's I Am A Cat: The Manga Edition***
Soseki Natsume

10 ***Rebel Cats: Brave Tales of Feisty Felines***
Kimberlie Hamilton

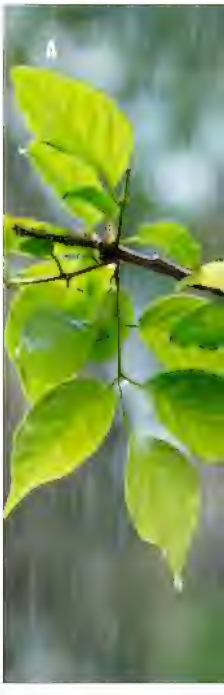
THE WINNERS!

2024 *In The Field* Photography Contest

THE WINNERS!

The Field Museum is pleased to announce the winners of the 2024 *In The Field* Photography Contest!

Thank you to all who participated. We loved seeing the Museum and the natural world through your eyes. Make sure to join us again next year and, in the meantime, view these wonderful photos in-person in the Member Holiday Lounge, Tuesday, Dec. 26 through Friday Jan. 5 from 10am–4pm.



CATEGORIES:

Real-Life Diorama

A. Waiting For The Storm To Pass
Photographer: Ligia Selagea

A parrot waits out the rain in Iguaçu National Park, one of the most endangered biomes in the world with less than 2% of it under protection.

B. Giant's Bathtub
Photographer: Jess Olhava, age 12

Filling up the Giant's Bathtub at Matthiessen State Park.

Urban Wildlife

C. Five-Week-Old Cooper's Hawk
Photographer: Michael Lewis

This five-week-old Cooper's Hawk is one of five born and raised in a nest in our backyard on the north shore of Chicago.

D. Our Currant Neighbor
Photographer: Julia Czechowska, age 10

This Eastern Chipmunk has lived in our backyard for a few years. We see it almost daily in the spring and summer. Here it is looking over our red currant bushes. Every time we see it, it brings us joy.

Museum Moments

Eye Spy (on page 9)
Photographer: Soney Olhava

Unis-Ankh's ka spies you from his Ancient Egypt tomb.

E. History in my Hand
Photographer: Elliott Doherty, age 8

Forced perspective image composed by and featuring the photographer himself and Máximo the Titanosaur.

SWAMP CREATURE RULED BEFORE THE DINOSAURS

BY KATE GOLEMBIEWSKI, PUBLIC RELATIONS, AND **MALAYA TINDONGAN,** INSTITUTIONAL ADVANCEMENT

Forty million years before the first dinosaurs evolved, a ferocious predator lurked in swampy waters. Its skull alone was over two feet long. Meet *Gaiasia jennyae*, the swamp creature with a toilet seat-shaped head. Jason Pardo, PhD, an NSF postdoctoral fellow at the Field Museum, co-led a paper in *Nature* journal 631 about the giant stem tetrapod.

"*Gaiasia jennyae* was considerably larger than a person, and it probably hung out near the bottom of swamps and lakes. It's got a big, flat, toilet seat-shaped head, which allows it to open its mouth and suck in prey. It has these huge fangs, the whole front of the mouth is just giant teeth," says Pardo, "It's a big predator, but potentially also a relatively slow ambush predator."

The fossil is named for the Gai-as Formation in Namibia where it was found, and for Jenny Clack, a paleontologist who specialized in the evolution of early tetrapods.

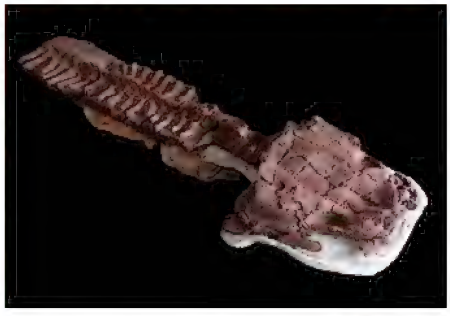
Pardo's co-lead author, Claudia Marsicano, PhD, of the University of Buenos Aires and her colleagues found the fossil. The team unearthed several specimens, including one with a well-preserved, articulated skull and spine. After examining the skull, Marsicano noticed large fangs that were unusually interlocked, making a unique bite for early tetrapods.

300 million years ago, Namibia was near the 60th parallel, almost even with the northernmost point of Antarctica today. And at that time, the Earth was nearing the end of an ice age. The swampy land near the equator was drying up and becoming more forested, but closer to the poles, the swamps remained, potentially alongside patches of ice and glaciers.

"*Gaiasia* is a stem tetrapod—it's a holdover from that earlier group, before they evolved and split into what would become mammals and birds and reptiles and amphibians, which are called crown tetrapods," says Pardo. "It's really, really surprising that *Gaiasia* is so archaic. It was related to organisms that went extinct probably 40 million years prior."

And while *Gaiasia jennyae* is just one species, it yields big-picture information for paleontologists studying how the world was changing during the Permian period. *Gaiasia* reveals that what occurred in the far south was vastly different than at the Equator and can help scientists learn more about other animals at that time. Finding *Gaiasia* in the far south also tells scientists about ecosystems that support predators like it, and opens the door to potential further discoveries.

ROGER M.H. SMITH



GABRIEL LIO

(Top) Gaiasia jennyae *as was found in the field with C. Marsicano.*

(Above) Fossil skeleton, including the skull and backbone, of Gaiasia jennyae.

(Left) Artist's rendering of Gaiasia jennyae.

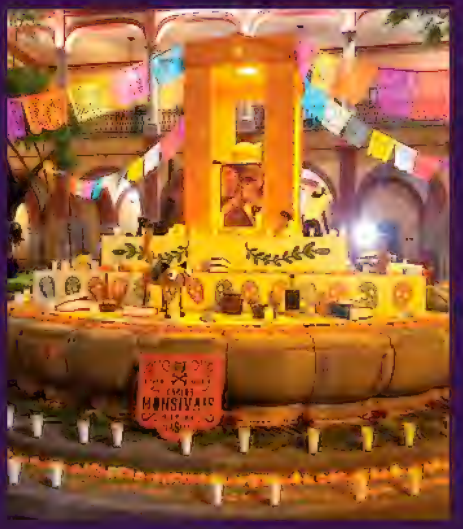
C. MARSICANO

EL DIA DE LOS MUERTOS

***El dia de los muertos*—translated to "the day of the dead"—is a holiday traditionally celebrated in Mexico on November 1st and 2nd. You may have seen symbols from the celebration like colorful skulls called *calaveras*, colorful paper banners, yellow marigolds, and candles.**

Although *el dia de los muertos* is often associated with Halloween, the holiday has its own origins and celebrations rooted in Aztec beliefs and traditions. The origins of the holiday go back to the Aztec goddess of death, *Mictecacihuatl*, seen as one of the rulers of the underworld. The legends about the holiday say that it falls on nights where the veil between the world of the living and dead is thin.

Today, the celebrations of *el dia de los muertos* are to commemorate the lives lost. Rather than mourning the loss of loved ones, the holiday is meant to be a colorful and passionate celebration of life. To honor those who have passed away *ofrendas*, or offerings, are made often on alters including photos, food, flowers, candles, and mementos all relating to the deceased.



El Dia de los Muertos alter decorated with *oferendas*, candles, marigolds, and papel picados (paper flags) in San Luis Potosí, Mexico.

© JOANNAH TIMDONGAN

SUGAR CANDY SKULLS

One of the most commonly recognized symbols of *el dia de los muertos* is the *calavera* (skull). These colorful, decorated skulls are seen on masks, face paintings, decorations, and on a traditional sweet called sugar candy skulls. The wearing and decoration using *calaveras* is another connection between the living and those who have passed.

DEAD BREAD

A food that is often associated with this celebration is "pan de muerto", meaning "bread of the dead", and nicknamed "dead bread". This sweet bread is eaten both by those celebrating *el dia de los muertos* and also given as an *ofrenda* to nourish those who have passed.

YELLOW MARIGOLDS

Another symbol frequently seen in *el dia de los muertos* is a bright array of yellow marigolds, or *cempasúchils*. They are used to decorate alters and guide the spirits of those who have passed with their bright color and strong, musky scent.

GATHER THE FAMILY
AND MAKE YOUR OWN

PAN DE MUERTO

There are various ways of making and decorating Pan de Muerto depending on who makes it and their traditions. One of the most common depictions of dead bread is as a round loaf with a ball of dough on the top and bone-like pieces of dough placed around the ball. Many view this symbolism as representing a skull and bones, while others have different interpretations.

INGREDIENTS

½ cup milk

½ cup water

4.5 tsp of yeast

5 cups of sifted flour

½ cup unsalted (1 stick) room temp butter

½ cup sugar and some for dusting

4 eggs

Zest of 2 oranges

1 tbsp whole anise seeds

1 tsp salt

INSTRUCTIONS

1. Warm milk and water in a medium bowl then add yeast and whisk to combine. Let it sit for 10 minutes and leave to become foamy.
2. Mix in ½ of the flour. Leave it to rest until it has doubled in size, about 25–30 minutes.
3. In a large bowl, cream the butter and sugar with a whisk or mixer until light and fluffy.
4. One at a time beat the eggs into the large bowl.
5. Add the yeast mixture to the large bowl and mix until fully incorporated.
6. Slowly add the remaining flour, stirring between additions, using your hands if needed. Mix until the dough pulls away from the sides of the bowl.
7. Add the orange zest, anise seed, and salt and mix until the dough does not stick to the bowl.
8. Knead the dough on a clean, greased surface until it is shaped into a ball.
9. Grease a large bowl and add the dough. Cover and let rise in a warm place until it has doubled in size (1.5–2 hours).
10. Gently punch the dough down and add it to a clean, greased surface.
11. Divide the dough into 6 pieces and roll into balls. (If you don't want to decorate the bread, *skip to step 15*)
12. For decorating, take a ball of dough and set about a third of it aside. Take the smaller piece of dough and divide it again into three balls.
13. Using two of the smaller pieces of dough, roll them out into logs and form into bone shapes.
14. Add a small amount of water to the larger piece of dough and place the "bones" on top in an "X" shape. Lightly press the "bones" into the dough and create an indentation to add the remaining dough ball at the center of the "X".
15. Cover and repeat for the remaining 5 dough balls, and let rise in a warm place for 45 minutes.
16. Brush the bread lightly with an egg wash (beaten egg with water).
17. Preheat oven to 350 degrees, then bake until golden brown (about 25–30 minutes)

OPTIONAL:

Melt some extra butter in the microwave or a saucepan, brush over the bread after cooling, and sprinkle it with extra sugar.

DECORATE YOUR OWN MASKS!

Dressing up in masks and costumes has been a tradition for thousands of years. But did you know that people used to wear masks as disguises to ward away spirits? Today, we wear colorful costumes, face paint, and accessories to celebrate Halloween and have fun pretending for a night!

Try out the cat mask, or use your imagination to create your own creature or designs!

SUPPLIES

- [ ] Mask pattern (on back)
- [ ] Markers, crayons, feathers, glitter, or anything else you want to decorate with
- [ ] Scissors
- [ ] Glue
- [ ] String
- [ ] Cardstock (optional)

INSTRUCTIONS

1. **GATHER YOUR SUPPLIES;** Scissors, glue markers, crayons, feathers, glitter, and anything else you want to add to your mask.
2. **TRACE AND CUT OUT YOUR MASK:** Cut out the mask templates on the back side of this sheet, or trace them onto a separate sheet of cardstock or paper to cut out instead.
3. **DECORATE!** Have fun making your mask perfect for you.
4. Once you're happy with your mask design, **MEASURE OUT SOME STRING** that can reach around your head and leave a few extra inches. **CAREFULLY TIE** each end of the string to holes punched on either side of the mask. Adjust so it fits comfortably.
5. **SHOW OFF** your unique mask to your family and friends. Or, wear your cat mask to our upcoming *Cats: Predators to Pets* exhibition!

TIP!

Parents, if you would like to make more masks, trace the mask template onto another piece of paper or thin cardboard. Cut out the traced mask and decorate!

TRACE OR CUT OUT YOUR MASKS
DECORATE WITH MARKERS, GLITTER, FEATHERS, AND MORE!
TIE STRING THROUGH THE HOLES TO WEAR

ARJAN MANN

WELCOME ARJAN MANN, PHD!

BY MARK ALVEY, ACADEMIC COMMUNICATIONS MANAGER

The newest member of our curatorial faculty is Arjan Mann, PhD, Assistant Curator of Early Tetrapods, who joined the Museum in early June. Mann studied Devonian fossil fishes from Ontario for his Master's at the University of Toronto, and received his PhD from Carleton University. Prior to joining us, he was a Postdoctoral Fellow at the National Museum of Natural History in Washington DC. "I visited the paleontology collections in April and May of 2016 for my dissertation research, a taxonomic revision of Mazon Creek tetrapods. Of course, the Field Museum Mazon Creek collection is the best in the world; it was, and still is, instrumental to my research," said Mann. "I also looked at fossils of the Permian predator *Lycaenops* with an eye to uncovering the taxonomic diversity in the genus, and came back in October to look at more Mazon Creek tetrapods from three newly acquired collections."

Mann's publication record includes articles in *Nature Ecology & Evolution, Frontiers in Earth Science, Royal Society Open Science, Zoological Journal of the Linnean Society,* and *Journal of Paleontology*. His interests in vertebrate evolution are diverse. Last November he published a study in *Journal of Vertebrate Paleontology* with Field Museum Curator Ken Angielczyk on large-ish (about 6 feet long) tetrapods from Zambia—the synapsid carnivore *Gorgonops* and the early mammal relative *Endothiodon*—filling a long-standing gap in the vertebrate fossil record of that country. Just before starting at the Field, Mann and his PhD student Calvin So (George Washington University) published the description of a tiny 270-million-year-old amphibian that had been sitting in the Smithsonian fossil collections since 1984 (they named it *Kermitops gratus*, in honor of Kermit the Frog—Kermit, because the fossil has big frog-like eyes, plus the Greek suffix "-ops," which means face).

But Mann has a particular passion for the Mazon Creek assemblage, and besides envisioning many new fieldwork projects there, he confesses that he is eager to dive back into that collection. "There are hundreds of vertebrate fossils in the Mazon Creek Collection—microsaurs, amphibians, sharks, and other fish—and 40,000 invertebrates, with tons of material that has not been described, and untold new species to be discovered. I can hardly wait!"

"The Field Museum Mazon Creek collection is the best in the world; it was, and still is, instrumental to my research."

(Above) From left to right: Fabiany Herrera, PhD, (Negaunee Assistant Curator of Fossil Plants), Arjan Mann, PhD, and Rich Holm, Field Museum Volunteer, at a recent fossil hunt in the Mazon Creek assemblage sponsored by the Earth Science Club of Illinois (ESCONI).

DELANEY DRUMMOND © FIELD MUSEUM

JANET HONG © FIELD MUSEUM

THE MONA LISA OF THE JURASSIC

BY JANET HONG, SENIOR PROJECT MANAGER FOR EXHIBITIONS

Like visiting the Mona Lisa at the Louvre, when some folks see the momentously important Chicago *Archaeopteryx* in person for the first time, they find it... kinda smaller than they expected.

But come to the Museum, and take a good, long look at the world's oldest bird: Its beauty and significance will bowl you over. You realize how and why this creature's smallness, its hollow bones, and airfoil-shaped feathers enabled it to become the first dinosaur with feathered wings to take off into the air, so many years ago. In fact, I wish Leonardo da Vinci, bird lover that he was, had the chance to marvel at this creature's revolutionary design—that is, its marvelous adaptations through natural selection.

If you're an evolutionary biologist, or a dino-obsessed kid, the charisma and scientific stature of *Archaeopteryx* are self-explanatory. However, the Chicago specimen, as scientists call it, can never be a big sculptural object to experience in a gallery, like SUE the *T. rex* and Máximo... The Chicago *Archaeopteryx's* feathers, soft tissues, and bones are too fragile to ever disarticulate from their surrounding rock. So the Exhibition's team wanted to provide different entry points to experience this animal's marvels.

It was improbable chance that allowed these remains to be so well preserved from 150 million years ago. Dr. Jingmai O'Connor—the Field's Curator of Fossil Reptiles—and the exhibition team created a three-dimensional animation depicting how this animal became a fossil, as well as how it flew and behaved when it was alive in its Jurassic world. To do this, we combined scrupulously accurate, CT-scan-based visualizations of our actual fossil with a Victorian-era theatrical technique called a "Pepper's Ghost." The recreation you now experience in the gallery is the best 3D visualization of an *Archaeopteryx* you can find anywhere in the world.

Interestingly, one of the team's first impulses was to suggest an "animated mural" portraying *Archaeopteryx* in a landscape, using the style of Charles Knight—the painter whose historic murals in elegant pastel colors are featured throughout the Field's *Griffin Halls of Evolving Planet*. However, probably more than most research disciplines, paleontology necessarily means choices about pictorialization of the past. As an artist herself, Dr. O'Connor thinks about the best ways to visually depict the animals she studies. We ultimately dropped the sentimentally appealing idea of using a Charles-Knight-esque style. We are proud of the superbly accurate, narratively rich digital projection that you'll experience in the hall.

Please come by to touch a large-scale replication of our priceless fossil specimen. You'll also enjoy our Jurassically accurate sculptures of living *Archaeopteryxes* as they perched in trees, glided through the air, and differentiated themselves from all other dinosaurs before, embarking on the evolutionary journey of birds that continues in our own day.

(Above, left) The Chicago Archaeopteryx.

(Above, right) Using CT scan data, we digitally modeled our bird's skeleton, and then added musculature and feathers. We chose different action poses for several sculptures, and 3D-printed them. Field Museum artist Janice Lim painted each sculpture by hand.

PREPARING AN ICON

BY RUDY ALBSMEYER, PUBLIC PROGRAMS DIRECTOR, SUE LING GIN CENTER

The Chicago *Archaeopteryx*, the 13th specimen of this species known to science, is the most important addition to the Genius Hall of Dinosaurs since SUE. Introducing "the icon of evolution" to visitors means more exciting avenues to engage in all things Dinosauria. But with the newest *Grainger Science Hub* exhibition, the focus is a human element of the story: fossil preparation.

The specimen arrived at the Field Museum mostly concealed within Solnhofen limestone. The 1,270 hours of on-site preparation, led by Chief Fossil Preparator Akiko Shinya and Fossil Vertebrate Preparator Connie Van Beek, ensured that the scientific integrity of the specimen came first. In fact, a small portion remains unprepared. Much like NASA preserving celestial samples for future study, this method offers ensuing generations the opportunity for discovery.

Associate Curator of Fossil Reptiles Jingmai O'Connor, PhD, notes that the Chicago *Archaeopteryx* redefines what we know about the skull structure, especially the delicate palate. It provides bone morphology in three dimensions. Even soft tissues are preserved. Without expert fossil preparation, evidence can be obscured or potentially destroyed.

Guests to the exhibition can explore the unprepared fossil counter slabs containing small pieces of *Archaeopteryx* bone, fossil preparation tools, and historical Solnhofen fossils that provide a then-and-now juxtaposition of preparation techniques.

(Below) Fossil Preparator Connie Van Beek and Chief Preparator Akiko Shinya work to prepare the Chicago Archaeopteryx *fossil for display.*

Acquisition of **the Chicago *Archaeopteryx*** was made possible through the generosity of the Walter Family Foundation and a challenge grant from an anonymous donor.

Additional support provided by:

Diana and David Moore

Jessica and Steve Sarowitz

Nicholas J. Pritzker

Lauer Foundation for Paleontology, Science and Education, Bruce Lauer and René Lauer

Marshall B. Front Family Charitable Foundation/Laura De Ferrari and Marshall B. Front

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ARC'TERYX
CHICAGO

The Chicago *Archaeopteryx* is part of the *Griffin Dinosaur Experience*, made possible by the generous support of Kenneth C. Griffin.

ARJAN MANN

DIVING FOR CLAMS ON ROBINSON CRUSOE ISLAND

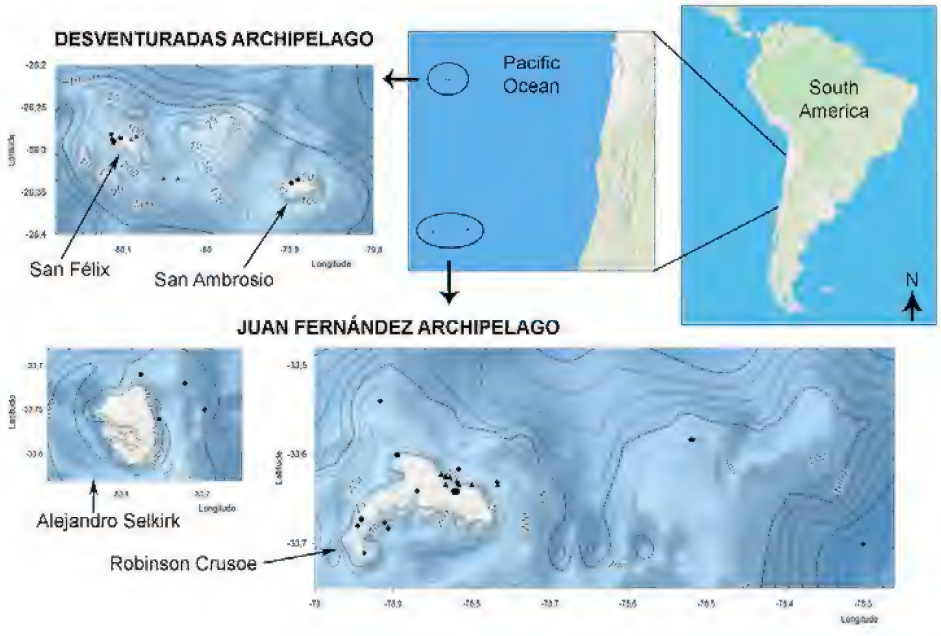
BY RÜDIGER BIELER, PHD, CURATOR OF INVERTEBRATES, NEGAUNEE INTEGRATIVE RESEARCH CENTER

My research interest in the biodiversity of marine bivalves (oysters, clams, mussels, and scallops) has led me to many remote places in the world's oceans. Among the most remote I studied are the island archipelagoes of Juan Fernandez and Desventuradas. These lie far off the Chilean coast in the Pacific and count among the least studied island groups in the world. Juan Fernandez is best known as the island of marooned sailor Alexander Selkirk, later fictionalized as Daniel Defoe's *Robinson Crusoe*, and served as a rare provision stop in the eastern Pacific during the era of sailing vessels. The earliest description of a local bivalve stems from such a stopover by Darwin's Beagle. The Desventuradas Islands, about 470 statute miles to the north, are even more isolated and have neither a harbor nor permanent inhabitants. A 1997 National-Geographic sponsored expedition (with then-fish-curator Mark Westneat, PhD, and colleagues from the U.S. and Chile) provided an opportunity for me to collect marine invertebrates. During a rather rough, month-long "cruise" on a Chilean Fisheries vessel, we sampled many sites in both island groups, usually by deep scuba diving off the steep volcanic cliffs.

While sorting through the collected specimens on board, I realized that many of the species seemed new to science. Back at the Museum, I held back naming new species because too little was known about the diversity of the South American mainland coast. That changed when two colleagues from the Universidad de Buenos Aires, Diego Zelaya, PhD, and Marina Güller, PhD, published on that coastal fauna. I invited them to the Museum in 2019 to work with me on the samples. We also studied the historical material of the few prior expeditions to the region, including the British H.M.S. Challenger Expedition (1873–1876) and the Swedish Pacific Expedition (1916–1917). This resulted in this year's publication of a monograph—our studies had doubled the number of known bivalve species in the region! The total (48 species) is very low compared to the nearly 300 species in the warm-water fauna of the Florida Keys, one of my regular research areas. It appears that many shallow-water bivalve groups have never reached the remote islands or did not find a suitable habitat in the volcanic rock environment. One of the most interesting outcomes is that the bivalve fauna is largely endemic to these islands, which supports the consideration of this region as its own faunal province and its need for ongoing protection as a Marine Park.

(Left) A selection of marine bivalves in the family Arcidae.

(Below) Bivalve collection sites in Juan Fernández and Desventuradas archipelagos.



ALL PHOTOS © RÜDIGER BIELER

Last Call:

UNSEEN OCEANS

Wednesday, December 11th, 6–9pm

Last call to see *Unseen Oceans* at the Field Museum before it drifts away! *Unseen Oceans* explores the mysterious, rarely-seen world hidden beneath the ocean's surface. Pilot through the depths in an interactive submersible game, discover glow-in-the-dark sea creatures, and get up close to live ocean animals.

This is an exclusive, after hours event for adults ages 21+. Engage with Field Museum scientists to answer your deep diving questions, participate in activities, and receive after-hours access to the *Unseen Oceans* exhibition before its upcoming departure.

Field Museum Major Sponsor: Magellan Corporation

Tickets are available at $45 for members and include an open bar of wine, beer and our specialty cocktail as well as hors d'oeuvres.

SCAN FOR MORE INFO

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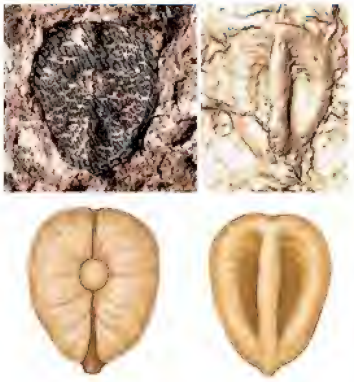
FABIANY HERRERA

(Left) Fabiany Herrera at the fossil plant locality, holding the newly-discovered earliest grape from the Western Hemisphere.

(Below) Lithouva—the earliest fossil grape from the Western Hemisphere, ~60 million years old from Colombia. Top figure shows fossil accompanied with CT scan reconstruction. Bottom shows artist reconstruction.



FABIANY HERRERA, ART BY POLLYANNA VON KNORRING

FROM DINOSAURS TO RAISINS: HOW ANCIENT GRAPES TELL A TALE OF EXTINCTION & SURVIVAL

BY FABIANY HERRERA, PHD, NEGAUNEE ASSISTANT CURATOR OF PALEOBOTANY, NEGAUNEE INTEGRATIVE RESEARCH CENTER

The next time you savor a glass of wine or munch on raisins, consider this: their ancient ancestors were shaped by the extinction of the dinosaurs about 66.5 million years ago. A study I led, published in *Nature Plants*, has revealed fossilized grape seeds from Colombia, Panama, and Peru, dating between 60 and 19 million years old. These fossils not only represent the oldest known grapes in the Western Hemisphere, but also shed light on how these plants spread and evolved after the dinosaurs disappeared.

These grapes are the oldest ever discovered in this part of the world. Their age is comparable to the oldest grape fossils found elsewhere, highlighting how grapes began to disperse globally in the aftermath of the dinosaurs' extinction.

Fossilization of fruits is rare due to their delicate nature, so seeds are often the key to understanding ancient plant life. The oldest grape seeds, found in India, are about 66 million years old, coinciding with the catastrophic asteroid impact that ended the reign of the dinosaurs. While we often focus on how this event affected animals, its impact on plant life was equally profound. It reset forest ecosystems, creating conditions that allowed grapes to flourish.

The extinction of dinosaurs likely transformed their habitats. Large dinosaurs would have kept forests more open by disturbing vegetation. With their disappearance, many forests became denser and more complex, providing ideal conditions for climbing plants like grapes. The diversification of birds and mammals in the post-dinosaur world also helped spread grape seeds across vast distances.

My journey to uncover grape fossils in South America began years ago, inspired by my graduate advisor, Steven Manchester, PhD, who had found the oldest grape seed fossils in India. Despite no prior evidence of grapes in South America, I was determined to find them. I remember the search feeling like looking for a needle in a haystack.

In 2022, during an expedition in the Colombian Andes, my team and I made an exciting discovery. After nearly two decades of searching, we found the oldest grape fossil in South America. This 60-million-year-old specimen was not only the first of its kind in the region but also among the oldest globally.

The tiny seed was identified by its unique characteristics and confirmed through detailed CT scans. The team named it *Lithouva susmanii*—"Susman's stone grape"—to honor Arthur T. Susman, a key supporter of South American paleobotany at the Field Museum. This find suggests that South America may be the birthplace of the larger group that includes the modern grapevine, *Vitis*.

Further fieldwork revealed eight additional fossil grape species across South and Central America, documented in the *Nature Plants* paper. These fossils span millions of years and illustrate the intricate history of grape dispersal and extinction. Many species once native to the Americas are now only found in the Eastern Hemisphere, demonstrating the resilience and adaptability of grapes over time, but also providing evidence of local extirpations.

As we face contemporary environmental challenges, I believe these ancient seeds offer crucial insights. These fossils provide a window into how life has navigated through past biodiversity crises. The story they tell us about ancient forests is truly remarkable!

TECHNOLOGY AT THE FIELD

BY MALAYA TINDONGAN, ASSISTANT EDITOR

In July 2023, the Field Museum purchased a new Scanning Electron Microscope, or SEM, through the Grainger Research Technology Fund and it was installed thanks to a grant from The Negaunee Foundation. In 2024, the Museum received a gift from ITW's North Star Imaging division of two advanced XCT scanners. Around the same time, the Museum received a $1.5 million grant from The Grainger Foundation to relocate and enhance the existing Grainger Cryogenics Laboratory.

SEM

The Scanning Electron Microscope, or SEM, is a tool used daily at the Museum. It utilizes electrons to generate high-resolution images of any solid surface of a specimen. Using an SEM for specimen samples can provide surface imaging, information on wear and tear of artifacts, and the chemical composition of the specimen. The chemical composition is obtained from characteristic X-rays coming off the sample when it gets scanned with the electron beam.

"It's versatile for all areas of science here at the Field Museum," said Philipp Heck, PhD, Sr. Director, Negaunee Integrative Research Center and Robert A. Pritzker Curator for Meteoritics and Polar Studies. "We can scan geological specimens such as mineral, meteorites, and fossils, as well as zoological and botanical specimens, and even cultural materials."

The use of the new SEM enables research on new acquisitions and additional learning about existing items in the Museum's collections. Active projects include studying pre-industrial African metals, to discover more about early metallurgy and innovation, and also mammal diversity, to support establishing new national parks in the Philippines. The SEM was also used to provide imaging and EDS (energy-dispersive X-ray system) of the Museum's *Archaeopteryx* specimen.

XCT Scanners

Rather than using electrons like the SEM to scan surfaces, XCT scanners utilize X-rays to produce high-resolution, 3D images of the interiors of objects. The process of using a XCT scanner is noninvasive, and allows Field Museum scientists to view specimens and virtually cut through them before attempting any physical actions. Through the scanners, 3D prints of specimens can also be generated as a comprehensive visual aid.

The Museum's new XCT scanners will support research in all areas of collections. Our botanists will be able to identify crucial anatomical characteristics of plant specimens and digitize the vast existing collection. XCT scanners have been used by Dr. Heck and his team to observe a fragment of a Mars meteor revealing components that help determine the age of the rock, settling previous debates.

Cryo Lab

The new The Grainger Cryogenics Laboratory houses over 200,000 preserved, frozen specimen samples. Six freezers contain 40,000-50,000 specimen samples each, kept cold with liquid nitrogen.

The Field Museum first collected and preserved frozen tissue samples in the early 1980s. The storage units not only contain tissue samples, but specimen samples from all biological collections each with their own corresponding freezer. These samples are crucial for DNA research on evolutionary relationships, mating systems, population genetics, and zoonotic diseases.

(Left) The Field has had a Scanning Electron Microscope onsite for a long time. This new model provides a state-of-the-art upgrade to a research machine used daily by Museum scientists.

(Below) The new cryogenic storage area allows the Museum to pump liquid nitrogen directly into the lab rather than refilling the nitrogen tanks by hand.

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Coming Soon! *Africa Fashion*

Fashion is more than clothing—it encompasses history, culture, community, and fine art. The Field Museum's newest exhibition, *Africa Fashion*, features works from 20 African countries whose designers and artists are hailed internationally as some of the world's leading creatives. This stunning collection is staged in a gorgeous gallery and features immersive displays of haute couture and ready-to-wear apparel, as well as photographs, literature, sketches, music, film and catwalk footage, textiles, and jewelry.

The story comes home in an adjacent gallery exhibition. Created in partnership with local Chicago fashion tastemakers Jennifer Akese-Burney and Melody Boykin, *Connecting Threads: Africa Fashion in Chicago* features objects from the Field Museum Collections paired with wearable art inspired by the artifacts and their stories.

Don't miss this triumphant exhibition of art and culture, past and present, coming to the Field Museum February 2025.

(Above, left) Imane Ayissi, Mbeuk Idourrou collection, Paris, France. Autumn/Winter collection, 2019.

(Above) Designs by Kofi Anash, Blue Zone collection, for Revue Noire magazine, Accra 1997.

V&A

***Africa Fashion* is organized by the Victoria & Albert Museum, London, England.**

Field Museum Major Sponsor:

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GERSON BUSS

(Left) An adult nine-banded armadillo from Brazil.

(Below) Feijó holding a young long-nosed armadillo.

XANDERSON FEIJÓ

REDEFINING THE NINE-BANDED ARMADILLO

BY ANDERSON FEIJÓ, PHD, ASSISTANT CURATOR OF MAMMALS, NEGAUNEE INTEGRATIVE RESEARCH CENTER

Nine-banded armadillos are a familiar sight to many in the United States, often spotted along roads in the southern states. Despite their popularity—they are even recognized as Texas' official state small mammal—they are not native to the US. Armadillos were introduced in the 1850s, initially in Texas, and have since spread northward, reaching Illinois in recent decades. Until now, it was believed that all nine-banded armadillos across the Americas belonged to a single species, ranging from the central United States to Argentina. However, my new study published this summer in *Systematic Biology* with colleagues from the US, France, Sweden, Mexico, and French Guiana, has overturned this century-old classification. By analyzing museum specimens and DNA, we discovered that what has been called the nine-banded armadillo is actually four distinct species, including one that is entirely new to science.

With this updated classification, the species found from the United States to Costa Rica is now named *Dasypus mexicanus*, or Mexican long-nosed armadillo, a name originally introduced in 1864. The species found in western Ecuador, Colombia, Venezuela, and extending to Costa Rica, *Dasypus fenestratus* (western Andean long-nosed armadillo) has been elevated from subspecies to species, while the armadillos inhabiting much of South America retain the original name (*Dasypus novemcinctus*). The fourth species newly identified in our study is restricted to the Guiana Shield—a region that includes eastern Venezuela, Guyana, Suriname, French Guiana, and northern Brazil—and has been named *Dasypus guianensis*, aka Guianan long-nosed armadillo. This discovery marks the first new armadillo species described in the past 30 years and underscores how much there is still to learn about mammal diversity. In the last decade alone, over 400 new mammal species have been described, with many of them found in natural history collections such as those at the Field Museum.

Fine-tuning the armadillo species is just the beginning. My colleagues and I are now exploring the ecological differences among the four species and assessing their conservation status. For example, each species could have different food and habitat requirements, which would impact efforts to preserve healthy populations of these animals via re-populating individuals from one area to another. Although the nine-banded armadillo is not currently considered endangered, this discovery requires us to shift the way we think about their conservation, and how we assess how threatened they are.

FIELD MUSEUM

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Explore one-of-a-kind holiday gifts that spark curiosity and wonder! From animal ornaments to handcrafted home decor, our exclusive items bring the wonder of the Field Museum to your loved ones. Our brand-new, museum-themed wrapping paper adds the finishing touch to every gift.

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MEMBER HOLIDAY LOUNGE

December 26, 2024–January 5, 2025
10am–4pm

Escape the chill and unwind at the cozy Members' Holiday Lounge!

Take a break from the holiday hustle and join your favorite dino friends in the Founders' Room! You and your family are welcome to enjoy a warm beverage, read a book, or have a family storytime together. Create fun holiday crafts with your young explorers, and don't forget to capture your perfect holiday photo at the Museum!

Don't forget to stop by and see the winners and runners up of the *In The Field* Photography Contest on display.

MEMBER OPPORTUNITIES

MEMBER MORNING DISCOVERY: SUE THE *T. REX*

Saturday, November 23rd, 10am

Calling all Archaeologists! Join us on Saturday, November 23, for Member Morning Discovery: SUE the *T. rex*! Bring your little ones and spend a fun-filled Saturday morning at the Museum for the second event in our new Member Morning Discovery series. You and your young explorers will journey back to prehistoric times with dinosaur-themed crafts, hands-on activities, and a member-exclusive viewing of our new 3D movie featuring SUE!

Be sure to look out for your E-newsletters for more information or visit fieldmuseum.org/our-events.

MEMBER EXHIBITION OPENING— *CATS: PREDATORS TO PETS*

Tuesday, December 17, 2024, 5:30–8:30pm

Pounce into the world of *Cats: Predators to Pets!* From wild carnivores to beloved companions, our feline friends have left their mark on both science and culture. Learn about the fascinating characteristics of cats, discover dozens of feline species from around the globe, and even spot your own pets in our fan submission gallery.

Join us for an exclusive after-hours opportunity to explore our newest special exhibition, enjoy an evening full of engaging family-friendly activities, and a chance to hear from Field Museum experts during a lively panel discussion in James Simpson Theatre. We hope to see you there!

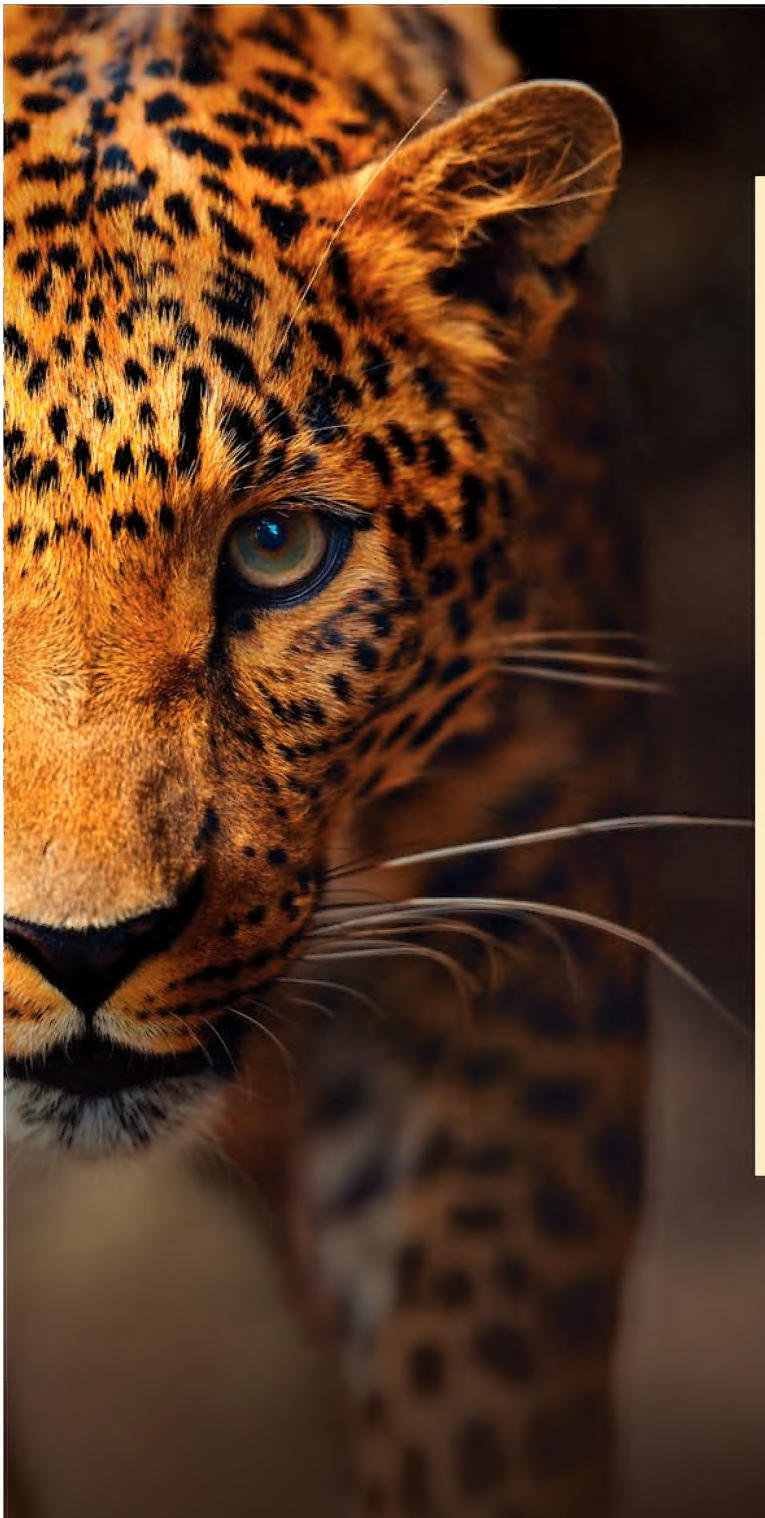
Museum Hours

The Field Museum is open from 9am–5pm every day except Thanksgiving and Christmas Day, with last admission at 4pm. For special hours, parking, and public transportation options, visit **fieldmuseum.org/visit**.

The Field Museum salutes the people of Chicago for their long-standing support of the Museum through the Chicago Park District.

UNITED AIRLINES Official Airline of the Field Museum

ILLINOIS ARTS COUNCIL AGENCY This program is partially supported by a grant from the Illinois Arts Council Agency.



Thank you to the sponsors of *Cats: Predators to Pets*

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Field Museum Major Sponsor:

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This exhibition was created by the Muséum national d'Histoire naturelle, France.

The Field Museum gratefully acknowledges the sponsors and supporters of *Cats: Predators to Pets*.

Join us at the Museum on **Sunday, December 15th** for an event with our purr-fect partners at Anti-Cruelty Society, a local animal welfare organization

Scan this QR code for details:

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GIVE THE GIFT OF DISCOVERY THIS HOLIDAY SEASON

Maybe it's SUE the *T. rex*. Maybe it's *Native Truths: Our Voices, Our Stories*. There's something at the Field Museum you love and want to share with the people close to you. What would it be like to share that exhibition or specimen that sparks someone's journey of discovery? A gift membership can be the perfect way to share your love of the Field Museum with those close to you and let them create their own lifelong memories.

- Free Basic admission, along with free or discounted tickets to special exhibitions
- Invitation to our Annual Member's Nights and many more virtual programs exclusively for members
- Discounts on year-round educational programs and in the Museum's stores and restaurants
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Purchase a gift membership today to start someone's exciting exploration. Gift recipients have 90 days from the purchase date to activate their membership. To learn more about our gift memberships, email us at membership@fieldmuseum.org or telephone us at 312.665.7700. Thank you for continuing to support and share the Field Museum's scientific explorations, conservation, and shared cultural experiences.